



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/030,087

01/14/2002

Masahiro Hatakeyama

020018

4284

23850

7590

10/08/2003

ARMSTRONG, KRATZ, QUINTOS, HANSON & BROOKS, LLP
1725 K STREET, NW
SUITE 1000
WASHINGTON, DC 20006

EXAMINER

JOHNSTON, PHILLIP A

ART UNIT

PAPER NUMBER

2881

DATE MAILED: 10/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/030,087

Applicant(s)

HATAKEYAMA ET AL.

Examiner

Phillip A Johnston

Art Unit

2881

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 July 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☒ Claim(s) 9 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

Detailed Action

Examiners Response to Arguments

1. Applicants arguments are moot in view of new grounds for rejection.

Claims Rejection – 35 U.S.C. 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-5 as amended, and newly added Claims 6-9 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,518,572 to Kinoshita.

Kinoshita (572) discloses a plasma chamber (ion source) 20 having plasma generating means (not shown), a charge exchange chamber 22 for generating neutral particles such as radicals and so on by neutralizing positive ions generated in the plasma chamber 20 through charge exchange, and a processing chamber 24 for etching (plasma processing) an object S to be processed with neutral particles generated from the charge exchange reaction.

The above described plasma chamber 20 is provided with a gas supply port 20A for supplying gas as plasma material. An ion extracting electrode (grid electrode) 25 made of graphite for extracting ions from the plasma chamber 20 to the charge exchange chamber 22 is disposed between the plasma chamber 20 and the charge exchange chamber 22.

The charge exchange chamber 22 is provided with a gas supply port 22A for supplying charge exchange gas and a mesh type accelerating electrode 26, which is opposed to the ion extracting electrode 25, for accelerating positive ions extracted from the plasma chamber 20. The ion extracting electrode 25 and the accelerating electrode 26 are respectively connected to the ion accelerating power supplies 28A and 28B for applying an optional voltage across both electrodes in a direction where the ions are accelerated.

The charge exchange chamber 22 is provided with a mesh type ion repellent electrode 30 in parallel with the accelerating electrode 26 to allow to return the ions, which have passed through the accelerating electrode 26 in a reverse direction. In the drawing, 32 denotes a variable power supply for applying a desired voltage to the ion removing electrode 30.

A porous plate (hereafter also referred to as the "microchannel plate") 34 is provided between the charge exchange chamber 22 and the processing chamber 24 to partition these chambers and the microchannel plate 34 allows neutral particles generated by the charge exchange chamber 22 so that neutral particles may be supplied to the processing chamber 24. In other words, the microchannel plate 34 is

Art Unit: 2881

provided with a number of linear microchannel holes (fine through holes) 34A each of which extends in the direction of thickness as shown in an exploded partial magnified view of FIG. 2. Neutral particles such as radicals can pass through these Microchannel holes 34A from the charge exchange chamber 22 to the processing chamber 24.

The microchannel plate 34 can be formed with a shower nozzle type thin quartz which comprises an assemblage of hollow glass fibers each having a hole of, for example, approximately a few micron meters to 100 μm in diameter and its thickness 1 can be several hundreds of μm to a few millimeters. See Column 10, line 36-67; and Column 11, line 1-18.

Kinoshita (572) also discloses in FIG. 7 a magnified partial sectional view showing the microchannel plate 34 with the first surface electrode 34B and the second surface electrode 34C on both surfaces, the accelerating electrode 26 and the ion repellent electrode 30 are eliminated, the first surface electrode 34B is connected to the power supply 28B and the second surface electrode 34C is connected to the power supply 32. This embodiment enables the above first surface electrode 34B to function as an accelerating electrode and the above second surface electrode 34C to function as an ion repellent electrode and therefore the etching system can be made further compact as compared with the etching system of the above fifth embodiment. See Column 16, line 23-40.

Kinoshita (572) further discloses the plasma chamber 20, charge exchange chamber 22 and processing chamber 24 are formed, as a whole, in a substantially

Art Unit: 2881

tubular shape as illustrated in FIG. 13, which shows the outline of the external profile, the periphery of the charge exchange chamber 22 is partly formed with a quartz glass 22B and the xenon lamp (neutral particle exciting means) 238 is provided on the outer periphery of the quartz glass 22B. See Column 22, line 54-61.

Amended Claim 1 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kinoshita (572).

Kinoshita (572) discloses that the etching system used is provided with the microchannel plate 34 of approximately 160 mm in diameter and approximately 1 mm in thickness 1 having the microchannel holes 34A with diameter d of approximately 12 μm . See Column 13, line 35-38, and Figure 2.

It is inherent in Figure 2 of Kinoshita (572) that the open area ratio percentage of the porous plate shown is equivalent to "an open area ratio of 85% or less" as recited in amended Claim 1.

It is also well known in the art to use a cross mesh as recited in newly added dependent Claims 8 and 9. See for example U.S. Patent No. 4,021,276.

Conclusion

4. The Amendment filed on 7-17-2003 has been considered but the arguments are moot in view of new grounds for rejection.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phillip A Johnston whose telephone number is 305 7022. The examiner can normally be reached on 7:30 to 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R Lee can be reached on 703 308 4116. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872 9318 for regular communications and 703 872 9319 for After Final communications.

Art Unit: 2881

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0956.

PJ

September 23, 2003



JOHN R. LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2300